# Industrial FINISHING

Reg. U. S. Pat. Off.

**Devoted to Product Finishing in the Factory**

**Vol. X, No. 6** **APRIL, 1934** **$2.00 a Year**


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# THE FURNITURE FINISH OF 1934

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# Letters from Readers of "Industrial Finishing"

**The names and addresses of firms or individuals whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.— The Editor**

## Screen Process Painting

We note the article on "Screen Process Painting" by Harry L. Hill (March issue, pages 30, 31, 32) which gives some interesting general information. Screen process paints are among our best selling specialties, our staff having devoted a great deal of effort to the development of this class of material to a point of high perfection. We will be glad if you will refer any inquirers on the matter to whichever of our offices is nearest. We will also be glad to send copies of our Screen Process Hand-Book to any who are really interested.—X.Y.Z. Co.

## Suede Finish

We would like to know the name of the manufacturer or manufacturers of spray lacquer who are turning out a "two spray combination" (one applied on top of the other) that produces a finished effect that looks like suede leather or suede fabric. We mean the surface, after this combination is applied, looks like it had been covered with a suede leather or suede fabric.

If any one of your recent issues contains some article or advertising relating to this, please send us a copy; if not send us your latest issue, C.O.D.—V.K. Co. (Quality Leather Goods).

## Rubbing Machines

We are interested in the purchase of suitable rubbing and polishing machines such as could be used in a cabinet shop for manufacturing store fixtures, wall cases, shelving, showcases, wall paneling, etc. We believe the portable type of machines would be best suited to our purpose, but would like to have your suggestions in this respect. Also we ask that you forward us the names of several manufacturers known to you as putting out dependable equipment of this sort.—B.G.&H. Co.—(Bank, Office & Store Fixtures).

## Hangers for Dipped Work

In finishing our line of table tennis paddles, we roll a stain on the extreme edges. In order to color the handle end of each paddle we dip that much of it and then hang it upon a line to dry. Our difficulty is in getting a suitable hook or clamp to use for this purpose. We have tried a number of places but have not been successful. Can you refer us to somebody who would make a hook or clamp of this description? We want something that would fasten over the top of the paddle and clamp about ½-in. down from the edge. It would have to hold tightly enough to suspend the paddle in a hanging position and still have a jaw opening wide enough to clear the edge of the paddle, so as not to smear the finish.

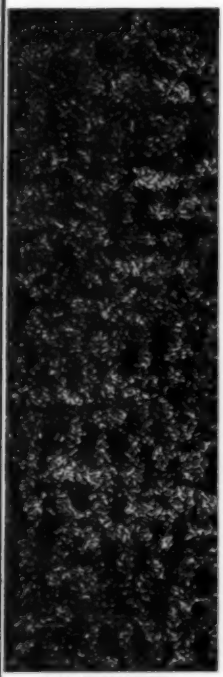
Will you put us in touch with someone who makes clamps suitable for this purpose? We need about 500 clamps.—E.T.K. Co. (Metal Lockers & Cabinets).

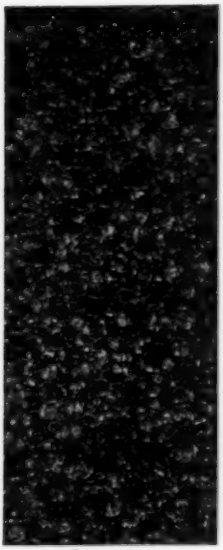
## What Metal Lacquer For Pipe Organs?

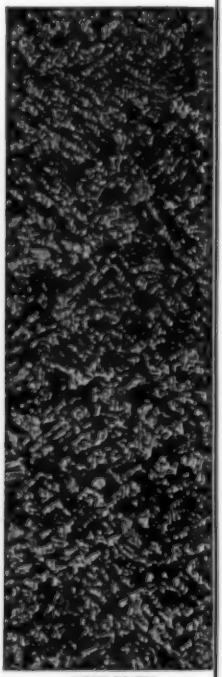
We have a problem which you can possibly help us solve, or perhaps you can put us in touch with a firm or two who can. We find that when pipe organs are installed under certain conditions, sugar of lead has a way of forming in the metal pipes. These pipes are made of a composi-

# One Coat Finishes for Wood and Metal

HILO







150 SHRIVEL CRYSTAL SHRIVEL

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## HILO VARNISH CORPORATION

HILO

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tion of tin and lead in varying proportions.

We know there are certain lacquers made for covering metal pipes which will prevent their tarnishing and otherwise preserve them, but we do not know just what firms specialize in making these lacquers. We think something of this kind could be worked out for these organ pipes and we will appreciate any information you can give us.—H.Q.P.T. (Pipe Organs).

## Smoker's-Pipe Varnish

I am interested in a special varnish for smoking pipes—an air-drying material that does not blister, peel or become tacky while smoking. There is some material on the market but it seems hard to locate the right concern to supply it. Can you help me in finding out where to get such a varnish?—F.N.F.

## Cement Felt to Aluminum

I am trying to find a cement which will make thin felt stick to sheet aluminum, but so far have been unable to get anything satisfactory. If you can supply any information on this, I will greatly appreciate it.—G.F.C. (with Aircraft Co.).

## Photo Enlargements

We varnish photograph enlargements, but do not get the results we are after. When lacquers were tried and a thick coating was sprayed on to get a high gloss, which we desire, the pictures would not dry fast enough. Then, when varnish was used, the drying was still slower, therefore the pictures took on dust while drying. Is there any formula you could recommend in order to get a high gloss, transparent, quick-drying material?—N.B.G. (Pictures & Frames).

## What Stain for Fir Plywood?

Frequently we bid on inexpensive fixtures that are almost wholly constructed of ¾-in. thick fir plywood, and we experience difficulty in our finishing room on account of the prominent slash grain of these panels.

We worked out a formula using water stain doped with flour and pigment stain that subdues the slash grain and evens up the color, but it raises the grain badly and makes the surface wavy, even after the stain has dried out completely. It also has the disadvantage of delaying the finishing schedule, as apparently fir plywood soaks up more water and dries slower than other woods.

We put this proposition up to a number of finishing material manufacturers, one of whom sent us a sample each of a deep dark red mahogany and a warm brown walnut stain that worked ideal for the purpose. Sprayed on, it dried almost instantly, and while it was difficult to prevent entirely a faint appearance of streaking where the passes of the airgun overlapped, we overcame this by tinting the sanding sealer, using the same material, and crossing the passes of the spray gun.

The material appeared to be similar to a lacquer shading stain, with probably some pigment material, because it had to be shaken well before using—and possibly some sort of binder, because it appeared to fill up the pores better than ordinary oil stain or lacquer stain. There was only one trouble; subsequent shipments of the material were a sickly weak brown shade of walnut, and complaining on our part would not remedy this trouble, so finally we gave up in disgust and went back to our doped water stain.

We would like to make our own stain, using lacquer or thinner for a base and such other materials as can be readily procured in limited quantities from stain material dealers, since our production in this fir line does not warrant purchasing material in drum lots.—L.F. Co. (Store Equipment).

## Fluid Tinting Colors, O. K.

I just noticed an article in your February issue on page 49, under the subject of "Fluid Tinting Colors May Cause Trouble."

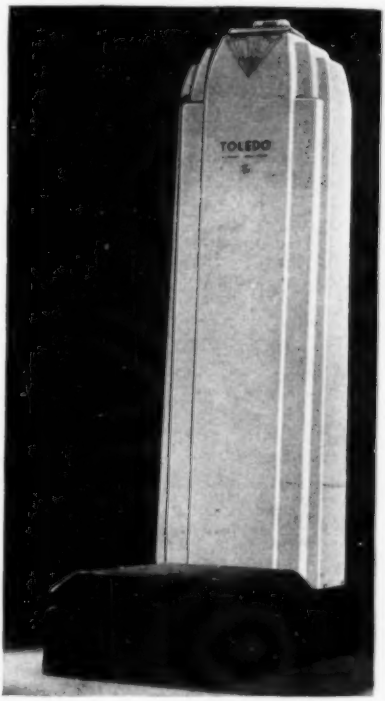
As a manufacturer of liquid oil colors we wish to correct an impression that the author may have had in regard to liquid colors, as he left the impression that the oil content was higher in the liquid colors than in the old type paste colors. This is not true in our case, and we know of one or two other manufacturers who are making their liquid colors of just as high pigment concentration as the old paste colors, the only difference being a change in the process of manufacturing which causes the colors to come out in a more fluid condition rather than a paste. It is for this reason that they can be used exactly the same as the paste colors, even getting better covering properties, as it requires less thinning to get the same consistency. The fluid tinting colors also have

*(Continued on page 49)*

# Toledo Scales

●

## Finished with DeVILBISS Spray-Finishing Equipment




**The finishes on Toledo Scales are applied with DeVilbiss Spray-Finishing Equipment. And the Toledo Scale Company has used DeVilbiss Equipment for 25 years.**

**Leading manufacturers in all industries know that the use of DeVilbiss Equipment produces better finishes, improving appearance and increasing salability. And by making finishing operations faster and more efficient, DeVilbiss Equipment lowers production costs.**

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# Use Explosion-Proof Electrical Fittings » »

by C. A. Bloom
Advertising Manager of the Appleton Electric Company

***In finishing departments and paint shops the electrical outlets, lights, switches, panel boards and all joint connections thereto should be of the explosion-proof type. This is an important protective measure which materially reduces the danger of fires starting or spreading, and as a result lower insurance rates prevail in factories having such protection.***

ELECTRICAL wiring in hazardous locations presents a problem to the engineer or executive who strives to minimize the possibilities of a fire or explosion which may jeopardize life and property in any industrial plant. Realizing the necessity for improving wiring methods and the urgent need for explosion-proof fittings which would serve to resist and arrest the dangers that arise from short circuits, switch arcs, or numerous other electrical causes, the National Fire Protective Association has drafted rules and requirements which are set forth in Article 32 of the National Electrical Code. These rules, when carefully followed, safeguard life and property in the best known manner.

Many industrial establishments, wherein part or all of the manufacturing is done in and about hazardous locations, have turned to the use of explosion-proof fittings, even though the code in their territory does not require them. Wise manufacturers consider it advisable to take these precautions purely as a matter of protecting their own interests, as well as for the purpose of effecting substantial savings in insurance rates through the use of the safest known methods of wiring. Not only are explosion-proof fittings being used on new work, but also on old wiring systems which are gradually being rewired according to Article 32, so as to minimize the possible dangers that might result from the use of ordinary wiring fittings in hazardous areas.

### What Hazardous Areas Are

Hazardous locations may be defined as places where inflammable, volatile liquids, highly inflammable gases or mixtures, combustible dusts of explosive nature, and easily ignitible fibers or materials are handled, manufactured, stored, or used. They are carefully classified by the Underwriters' Laboratories into specific classes and groups. Class I, Group D, for example, specifies atmospheres containing gasoline, common petroleum, ethyl alcohol, methyl alcohol, acetone, and lacquer solvent vapors.

The occurrence of a stray spark

in a hazardous location, where ordinary wiring methods and conduit fittings not of an explosion-resisting nature are used, might prove to be both costly and disastrous.

### Fumes Penetrate Everywhere

The problems of eliminating 1) the switch spark, 2) abnormal heat temperatures, and 3) faulty wiring have been the source of study by leading engineers for many years. They have learned that it is impossible to restrain the highly inflammable gases from entering the interiors of either the explosion-resisting or ordinary wiring systems because, in due time, explosive gases will eventually enter into the entire line through the various joints and through the breathing of the conduit system caused by temperature changes. Furthermore, gaseous vapors will fill every crevice on any occasion of cover removal.

### Confine Electrical Disturbances

Since the idea of rendering a switch unit entirely arc-proof is highly improbable, as the regulation of abnormal heat temperatures is equally as difficult, and as it is quite impossible to maintain an atmosphere free from inflammable gases within the interior of the fitting, therefore, to protect that section of the factory classed as hazardous, the logical solution is the positive confinement of the arc, heat, and possible explosion within the internal limits of the newly-developed explosion-proof fittings. These fittings are so called because of their ability to successfully imprison the dangerous arcing, intense heat, and subsequent explosion without allowing the gas-laden or fume-laden atmosphere on the outside to become ignited.

### Features of the Fittings

The explosion-proof electrical fittings I have in mind are made of durable cast material and of a balanced design. They are small . . . and yet the interiors are roomy with ample space for wiring and splices. The durable construction is fully capable of withstanding the high internal pressure which results from an explosion without bursting the fitting or loosening the screws or joints. As an added safety measure, the fittings are tested on the basis of a high safety factor as prescribed by the Underwriters' Laboratories, in order to provide a comfortable margin of protection and to dispel all possibilities of disaster.

### Ground the Conduit System

To further protect the hazardous location, the entire conduit system and electrical apparatus should be grounded in order to comply with the requirements of Article 32 of the National Electrical Code. In this manner, provisions for further safety are adopted in the event of insulation failure, short circuit, or high static charge. The necessity of grounding all neutral parts cannot be overemphasized.

---

## *Personal*

The Editor has a letter for each of the following former writers whose mail has been returned marked "Not at Address Given."

William Brownlee, Detroit.
Samuel S. Harkavy, New York.
Lawrence F. Hess, Jr., Minneapolis.
Bradford P. Millar, Brooklyn.
Phillip A. Patterson, Detroit.
Henry H. Smallwood, New Jersey.

We would like to know your present address, please.—I.F.

# And Now - - -
# « The Water Booth »

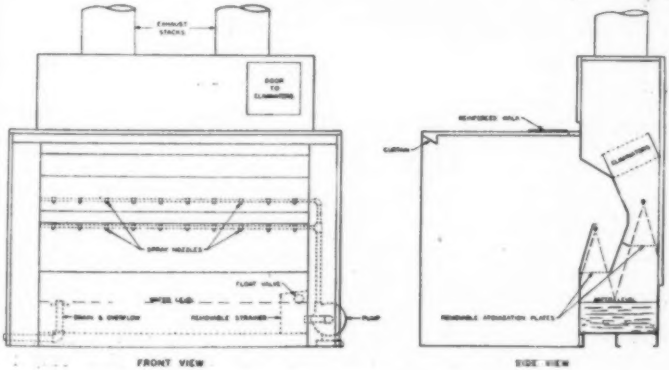
## by William J. Miskella

AFTER ALL these years of gumming up the exteriors of buildings, along comes something new! Who will say that the Depression has not done some good? We just had to sit down and think for a while in order to realize that there were things about the spray painting system that should be corrected—and outstanding among them was this idea of blowing all the dust and dirt out of one's own shop, and blowing it onto a neighbor's or on to the street for the automobiles and pedestrians to worry about. Now all that is preventable.

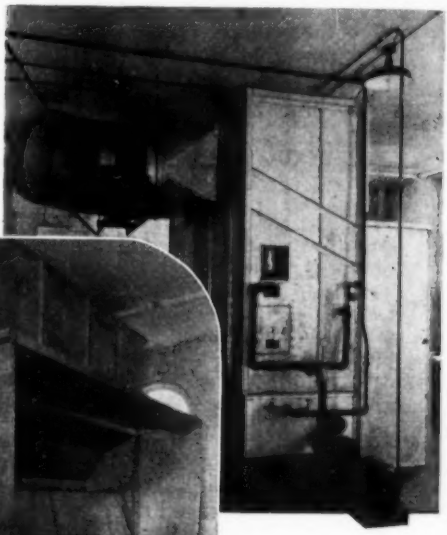
Many months of engineering, intensive research and development produced and placed in actual operation several water booth systems. The principle of this system is to draw paint vapors through a series of water sprays which wash out and precipitate the solids, preventing their exhaust to the outside.

The development of the water booth comes at a time when it will become practically a necessity because of changes which are taking place in finishing materials. The sprayed residue from many materials now in common use is slower drying and much more sticky than lacquer vapors. This makes the objection more pronounced, particularly in confined areas.

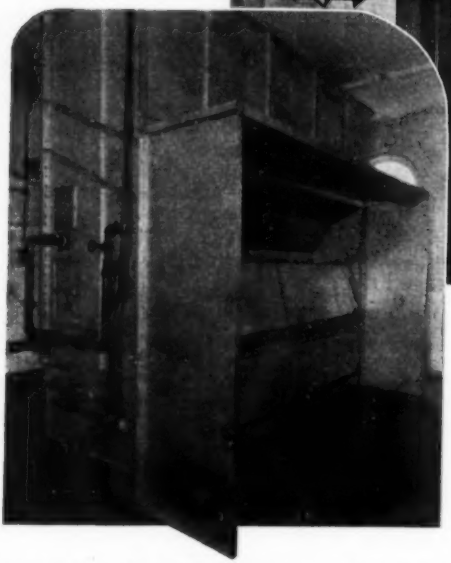
These water booths will probably find many unexpected appli-




FRONT VIEW SIDE VIEW



Below: Front and side view of water booth, as installed ready for service. Booths are of welded construction. Hinged front plates give access to tank and sprays. Tank may be cleaned from front of booth. Baffle plates are removable.



Above: A rear and side view showing, near the top, the outside motor mounted on a shelf suspended below exhaust pipe. This motor drives the exhaust fan. Water-tight doors provide convenient access to all sprays, strainer, overflow, valves and eliminator chamber.

cations in modern finishing rooms. Naturally their initial cost is higher than the conventional type of spray booth, but it will be found in many cases that the higher first cost will be absorbed by the savings which result.

There is a particular reason for using the water booth in connection with such finishing materials as primers and enamels, where the residue is heavy and sticky. Also, they are desirable where vitreous enamels are being sprayed, for they not only control the objectionable dust but they permit the solid matter to be reclaimed.

Cleaning costs are reduced considerably both inside and outside the building. Frequent cleaning of the exhaust fan, the exhaust pipe, and the system in general is eliminated. One may practically forget about the exterior cleaning of the building. Paint-laden vapors do not escape from the building, nor do they work their way back into the plant only to

be caught in the fresh air intake filters. There is less spray dust within the spray room to settle on and mar the finish of newly painted products.

Difficult installation problems, which have come up for solution in the past, may now be simplified. Outlet and exhaust piping may be more easily suited to fit a given condition. The height of the stack may be reduced as a general rule, and in some instances it may be entirely eliminated. Discharge may now be effected from a lower floor of a high building which otherwise might require a long stack that would in turn reduce the efficiency of the booth and fan. Maximum exhausting efficiency may be assured at all times as there is no accumulation on the fan or within the exhaust duct to retard the free passage of the exhaust.

Several desirable factors enter the new picture of a modern finishing room—savings in cleaning, lower maintenance, fewer neighbor complaints and most important of all, a cleaner finishing room.

Two sets of opposed water sprays are used. One set is directed with and the other is set against the air flow. This results in maximum efficiency of the solid separation by sprays, and reduces to a minimum the amount of water that must be taken from the air by the eliminators. It is important to know that the sprays are not directed against the eliminator plates, which are equivalent to six 60° angles; these eliminator plates remove free water from the discharged air at low velocity. Thus, a minimum of water passes out of the booth.

Hinged front plates are provided for easy access to tanks and sprays. The latter may be cleaned from the front of the booth—a very desirable feature. Watertight doors provide for free and convenient access to all sprays, strainer, overflow, valves and eliminator chamber. An easily removable tank screen and strainer box protects the inlet and float valve. The booth construction proper is water tight and welded.

## New Condenser for Compressed Air Lines

The DeVilbiss Co., Toledo, Ohio (manufacturers of air compressors and spray-painting equipment), announce the new, improved DeVilbiss heavy-duty condenser, Type HP-504. With this condenser, oil and water are effectively removed from the air by a baffle arrangement inside. No cotton or other waste is employed in this filter, so that frequent changes of waste are eliminated.

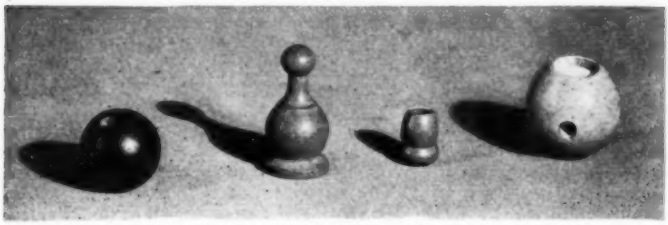
The condenser is sturdily built of black iron pipe and fittings. Inlet and outlet openings are conveniently located in the top cover. The air passes down through a pipe to the condensing chamber, at which point special construction features cause precipitation of moisture and oil to the bottom of the condenser where it may be drained.

## Ebner-Myers Varnish Co., Inc. Is New Name of Varnish Co.

Ebner-Myers Varnish Co., Inc., is the new name of what was formerly known as the Indianapolis Varnish Co., Inc., which recently purchased the plant and equipment of the old Stickney Color Co., 2245 Valley Ave., Indianapolis, Ind. The new name was decided upon to avoid confusion with other finishing-materials manufacturers whose names include the word "Indianapolis."

All of the personnel of the old Indianapolis Varnish Co. is associated with this new company, namely: John Myers, Hans Aamot, Charles White, Charles Sandberg, Emil Ebner and Ed. Ebner; also William D. Guyton, Augustus Coburn and W. W. Burgess.

The company is doing business at the above named location, and its line of products includes high quality varnishes and lacquers, pigmented lacquers, enamels, paints and colors.



*A rapid and economical way to finish these small wood turnings is to - - -*

# Shake Them in a Tray While Spraying

## by J. E. Greene

HERE IS a practical procedure for finishing small wood turnings other than by the tumbling process. This process of finishing was successfully put in operation in a toy factory equipped with bench spray hoods. A number of wooden trays are required, their dimensions being about 20-in. wide, 30-in. long, 4-in. deep, and made of 1-in. stock (net ¾ to ⅞-in. thick). The bottom of each tray consists of heavy fine-mesh wire screen. A suitable supporting frame on which to rest one or more loaded trays is conveniently placed in the spray booth.

The operator fills the trays about half full with small turnings and places one or more loaded trays on the frame in the spray booth. Holding the spray gun in one hand, he uses his other hand to shake the tray back and forth while spraying on a thin coating of finishing material.

The wood turnings should be given a sealer or filler coat before the color finish is applied. This sealer or filler can be put on by the same process—that is spraying the turnings in a vibrating tray.

After a light coat of finish is applied, the loaded trays are placed in a dry room and force-dried. The drying time and temperature will be governed by the type or brand of finishing material used; for example I have in mind a finish which, when applied by this process, dries in one hour at a temperature of 150° to 175°F.

A good quality of tumbling filler or sealer, and a color enamel that is elastic and not too sticky—these materials will give good results. Two thin applications of the finishing enamel, properly applied, will be sufficient to produce an excellent lustrous color finish.

With the necessary trays and

---

Editor's Note: The two wooden balls in this picture are ¼ and ⅜-in. in diameter respectively.

drying space available, a remarkably large volume of turnings can be finished per day, and the operator will use less finishing material than by the tumbling process and do the work in less time. The finish should be applied thin and sparingly; use just enough to show a solid coloring. Don't try to load on a heavy coat, as it will surely cause sags and runs. With some practice and care the operator will learn to accurately determine just the right quantity of finishing material to apply at each application—and he will know what consistency it should be.

### Supplemetary Notes

With proper care and a little judgment in the application of the finishing material, and the number of turnings in the tray while spraying, there will be no trouble from turnings sticking together to cause bridging or spotting of the finish. In fact it would be much less than by the tumbling process, as there is a much thinner coating of finishing material sprayed on the turnings. There is no necessity of any shaking the tray to smooth or polish the turnings after the finish has dried. The number of turnings to place in a tray will be governed according to their size and shape. It would not be advisable to have them lay more than three or four deep.

Since the trays are placed on racks in the drying room, it would help to give them an occasional shaking while the finish is drying. In the toy factory where this process is in operation there are two lines of five steam pipes to each header, running a distance of about 80-ft. in one corner of the finishing room. The pipes are about 1-ft. from the floor. A stationary skeleton wooden rack is built up about 5-ft. high over the steam pipes and spaced to accommodate the trays. As the operator passes back and forth with other trays he gives the trays that are drying a shake now and then.

After this process is once established, it is surprising how well it does the work—what a large number of quality finished turnings can be turned out with no waste to speak of, and how neat and inexpensive the equipment is for doing it.

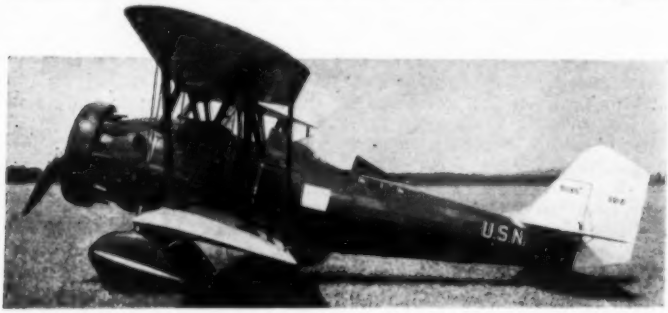
A further idea and thought—if improvements on the equipment just described are in line—is to arrange the loaded trays so they can be shaken mechanically by motor drive, leaving the operator free to handle the spray gun and exchange trays. Several different makes of vibrating devices, suitable for shaking trays, are on the market. This would mean less fatigue for the operator and it would give a more uniform shaking. Also, a suction hood could be arranged to open near the under side of shaker frame so as to pull the fumes in a more direct line from the tray of turnings being sprayed.

---

*Comments by J. Schroeter, President of Vibro Mfg. Co., Chicago, Ill:*

"We . . . believe our vibrating device could be adapted for the purpose of spraying small wood or metal parts with paint, lacquer or enamel to give them a surface coating. We have constructed a machine for coating candies, etc., and believe that with some alterations the same machine could be used for shaking trays.

The special motor of our vibrator causes the material handled by it to gyrate and tumble over in the bowl. A sprayer could easily be attached to the top of it and an arrangement made to discharge the surplus coating material. The proposition may require some experimental work. . . ."




A Vought "Corsair" military observation airplane. Color scheme: blue, aluminum and yellow.

# « Aircraft Finishing—II »

## by M. W. Mason

***Here the author presents some brief data on the cleaning and finishing of structural metal parts, and the sealer-coating of wooden structural members . . . and discusses at greater length the application of all dope coats on the fabric surfaces.***

✪ ✪ ✪

THE FUSELAGE, frame work, cowling and general metal surfaces must be perfectly free from all traces of grease. The cleaning of these parts consists of washing off the grease with a special clean-up liquid, and wiping each section dry while it is wet. In other words, the clean-up material cuts and dissolves the grease, but if it is not wiped dry before most of the thinner has evaporated the grease will be redeposited, making the operation useless. Chemical cleaners also can be used for this work.

The frame work then receives a brush coat of metal enamel, usually of lacquer base. Wooden surfaces, such as wing spars, ribs, etc., should be properly sealed with clear lacquer or a spar varnish. One generous brush coat is applied. This preserves the wood and helps prevent warping.

### Treating the Fabric

Considerable skill is required to properly attach the fabric. This must be tacked, sewed or laced in such fashion that after doping, the edges will not show scalloping. This is accomplished by fine stitching or close tacking. The fabric should be uniformly drawn and made sufficiently taut to remove wrinkles. Where the fabric is drawn too taut, the later dope coat contraction is very apt to pull the member out of line, giving the effect of warping. Special care must be exercised in the tail assembly, consisting of rudder, ele-

# As Perspiration Proof as the North Pole

ORDINARILY we wouldn't recommend anyone working themselves into a lather over anything — especially lacquer. It's not only bad for the digestion but up to now it would have been very bad for the lacquer as most lacquers, no matter how good they may be, just can't be friendly with perspiration.

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vators and stabilizers. The framework of these parts cannot stand excessive strain and must be true due to hinging, etc.

Creases in the fabric can usually be removed by wiping them with a rag slightly dampened with water. In such cases, the fabric must be permitted to dry thoroughly before the dope is applied. Failure to do this will result in a dope blush and failure of dope to adhere to the fabric.

Hollow sections such as wings, etc., must have proper vents to permit the escape of trapped solvent from the pocket between the fabric sides. This will permit faster drying.

### Doping the Fabric

As mentioned before, the object of applying dope is to give tautness, protection, strength and appearance to the ship. The first two coats are usually brushed to insure proper penetration. These are the only coats that are worked into the fabric, resulting in proper anchorage and sealing.

The consistency of the dope should be as heavy as good workability will permit. This runs about six seconds on the Gardner-Holt tubes. The fibers of the fabric usually raise considerably after the first coat but these can be scuffed off with a fine abrasive paper as soon as the surface is dry.

The number of coats of clear dope may vary from four to six coats. Some concerns brush each coat of dope. However, in most cases, after the second or third coat is brushed, the remainder is sprayed.

A 3½ to 4½-in. brush is generally used for brush work. The dope should be flowed out freely and not worked too much with the brush. Too heavy a coat is apt to cause the film to pinhole; excessive brushing causes roping.

Where the dope is applied with a spray gun, a large spray head of the fan type gives best results. Proper adjustment to afford good atomization must be made to eliminate gassing and pinholing. For spray work, the dope is reduced slightly more than for brushing.

A drying period of at least one hour should be allowed between coats.

Blushing or the precipitation of the nitro-cotton from the dope should always be avoided if possible. This trouble is caused by moisture from the air condensing on the wet dope film, precipitating the cotton. The film turns white (blushes) and is a failure. This condition can be overcome usually by adding sufficient retarder to the dope. In all cases, the recommendations of the dope manufacturer should be followed. When retarder is used, a longer drying period will be required between coats.

### Where Tape Is Used

Edges, seams, tacks and stitching are covered with a pinked fabric tape after or with the second coat of dope. Before this operation is started, the area should be inspected closely to make sure no tack heads are protruding. The sanding operations that follow would cut through these and mar the finish.

The strip to be taped is given a substantial coat of dope, and the tape is pressed into place with the fingers while the dope is wet. The top of the tape is then given a coat of dope after the tape is in place and dry. Sometimes pinholing appears during or after this operation. This may be overcome by

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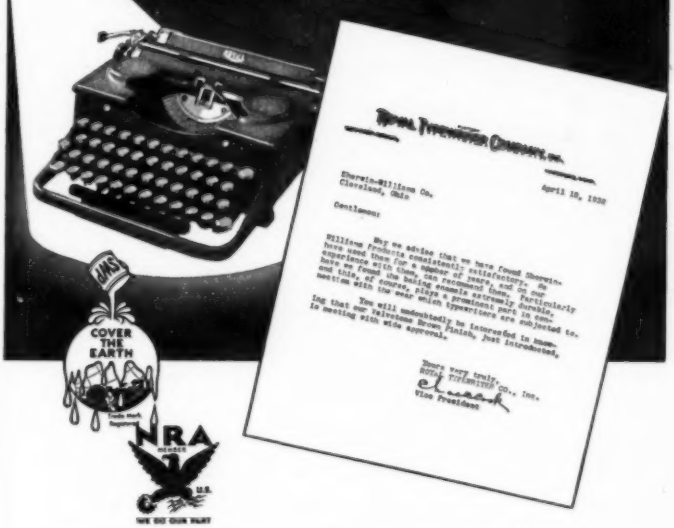





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soaking the tape in dope thinner before putting it in place. This permits the trapped air in the fabric to escape more readily before the dope top surface sets up. A pre-doped tape is also widely used for this work.

### After Second Clear Dope

Every second coat of clear dope is usually scuffed off with fine sandpaper. However, great care should be exercised to avoid cutting deeply into the film, as many failures of checking and patching have been traced to sand scratches in aircraft undercoat systems. Probably a safer practice would be to scuff off the second dope coat lightly and then dispense with any further sanding until the final coat of clear is on and thoroughly dry.

The pinholing of a clear dope coating is usually traceable to either too heavy consistency or to the application of too much material at a time; also, it may be caused by water or oil in the air line. As a rule, this pinholing can be overcome by reducing the dope slightly further, or by applying a little less dope at a time.

The skinning or surface drying of clear dope is usually due to too low a temperature in the finishing room. In case it is not practical to raise the temperature sufficiently to correct this, the dope manufacturer should be consulted. This condition, as a rule, is only experienced in the cold winter months.

### Guide Coat; Aluminum

Some shops use a guide coat after the last coat of clear is applied. In most cases, this consists in spraying two coats of clear dope mixed with a suitable amount (5-oz. to the gallon) of aluminum powder. Aluminum should be used in all cases. White dopes, etc., do no good; in fact they actually contribute greatly to a finish failure if used at this point. Really this aluminum coat is a filling and protective coating, rather than a guide coat. The aluminum coating should be lightly sanded.

The complete clear dope system, including the guide coat, if used, should be air dried at least 48 hours before wet sanding. In wet sanding, a paper should be selected that will not scratch (No. 320 wet-or-dry is suggested). It should also be watched closely for pick-up or paper gumming. The gumming of a paper will cause no end of sand-scratching with a possible effect on the durability of the system. Prevention of sand-scratching cannot be emphasized too much.

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*Part III of this article, which will appear next month or later, takes up the color coating of fabric surfaces and gives a more extensive discussion of the finishing of metal parts.*

---

## High Gloss Nickel Process

A new process for the electro-deposition of nickel — the Pyrene High-Gloss Nickel Process—has been developed and is being licensed by the Pyrene Mfg. Co., Metal Finishing Division, 560 Belmont Ave., Newark, N. J. Thick deposits of great brilliance and beauty, it is stated can be obtained, even at high current densities, in a highly efficient and stable electrolyte which is entirely self-sustaining from the anode.

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—FERD ROSEN

# Rich Brown Walnut

## for fine furniture

### by Ferd Rosen

**Surfaces to Be Finished**

| | |
|---|---|
| Butt Veneers | Solid Wood |
| Matched Veneers | Mouldings |
| Plain Veneers | Carvings |

**Operations to Be Considered**

| | |
|---|---|
| Bleaching | Highlighting |
| Staining | Antiquing |
| Sealing | Glazing |
| Filling | Lacquering |
| Shading | Varnishing |
| Blending | Rubbing |

THE GENERAL trend in walnut finishes has lately been for a warm rich brown color instead of the old dark or almost black color that has been used before.

One trouble in getting a walnut finish light enough has been on dark butt walnut veneer which is sometimes almost black. A number of finishers try various bleaching solutions to lighten up these dark butts, and if this process is done very carefully it is possible to get fairly good results. However, there are several drawbacks to this method of finishing.

If the bleaching solution is not entirely neutralized or removed from the wood before succeeding coatings are applied the finish film will perish very rapidly. The color on these bleached parts will become a dull grayish or greenish cast and the color on this bleached wood will lose all its beauty and depth.

The most satisfactory results obtainable with bleaches is to sponge off all bleached parts thoroughly with clean water after bleaching, and then, after this is dry, sand well and stain with a light brown amber-colored stain; then wash coat with pure shellac or sealer, before filling.

The stain formula mentioned below is about the right shade to use over bleached butt walnut parts.

Walnut crystals—(ounces).....1½
Orange water stain powder..... ½
Yellow water stain powder..... ¼
Dissolve in one gallon of water.

These materials can be obtained from manufacturers of stains and wood finishes. Spray the stain all over the articles which are made up of butt walnut and plain walnut to give a very rich brown walnut color without bleaching. This stain also produces a good base color on gumwood, and birch posts, and all solid wood parts,

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which parts later on can be glazed or shaded to match walnut panels.

After the stain is dry, apply a light wash coat of pure shellac or sealer, before filling.

The filler should also be of a light brown color to harmonize with the color of stain. After the filler is thoroughly dry, the glazing color or shading may be applied.

### Glazing, Shading, Antiquing

The oil glaze has practically taken the place of all shading, especially on the better grade of carved furniture. The cost of the glazing may be a little more expensive than shading with a spray gun, but the result is a much better looking antique effect, which cannot be produced by the use of a shading gun. The oil glaze can be sprayed on, but must be wiped, and blended out well and will leave all deep places in carvings, turnings, and ornamental mouldings dark, and the high points will clean off very easily and produce a good highlight.

This oil glaze for walnut finish is generally made up from burnt umber or Van Dyke brown ground in japan, and then reduced with turpentine, with a little boiled linseed oil added to make it wipe good and not set up too fast.

In cases where it is necessary to maintain a faster schedule in the finishing room, the glaze can be made up so as to dry hard enough in five or six hours before spraying lacquer over same. Ordinarily this glaze is left to dry over night; next day one or more coats of lacquer sprayed on.

### High-Sheen Flat Lacquer

It seems that at the present time the demand for a higher luster is more desirable, especially on goods that are sold in the Eastern market; also on new radio cabinets that are designed in the somewhat modified modern styles. For this purpose a high-sheen flat lacquer is used that polishes up to a high gloss after same has been rubbed with water and pumice, or wet sanded with water and fine wet-or-dry paper—No. 380 Tri Mite—and then polished up with a polishing compound, such as is used on automobile bodies.

This high-sheen flat lacquer, if used on parts that are not to be rubbed, has about the right luster to match up with the polished parts, such as tops or fronts of cabinets.

### High-Speed Varnish

There is at the present time a considerable demand for a fast-drying varnish. I have had a chance to try out some of these new varnishes and found them economical and satisfactory. In some cases it is possible to get a good enough finish with one coat of sealer and one coat of this high-speed varnish. I have finished goods with this new varnish and applied two coats of this varnish in one day, and it was dry enough to rub next morning. This varnish can be either rubbed to a dull finish or polished up to a high luster, and it is very hard and print resisting.

---

## Bakelite Molded

The sixth edition of the book "Bakelite Molded" was recently released by the Bakelite Corp., 247 Park Ave., New York, N. Y. It contains 48 pages 6x9-in. which describe and illustrate Bakelite molded materials for electrical, mechanical and chemical uses. Information is also included about the properties of Bakelite, the tests to which it is subjected, the molds, the machining, the processes, mold designs that should be avoided, and the company's engineering service.

*Color, Imitation Wood, Pearl Essence, Metallic, Wrinkle, Feather, and Luminous Finishes for —*

# Concrete Burial Cases*—II

by E. Perry

IN A PRECEDING article I explained how to finish concrete burial cases in solid colors, in imitation mahogany and walnut, and in pearl essence. Similarly to the preceding, imitation of metal caskets could be made as for instance dull statuary bronze, old silver—oxidized effect—and gun metal.

These may be executed with the various colored metallic powders, and over-glazed to produce the typical color and tone of the metals imitated. Metals cannot show depth, except that a brilliantly polished surface gives a semblance of depth whereas an unpolished surface is utterly devoid of depth. Therefore some revision of the preceding schedules must be noted.

### Attractive Metallic Finishes

After surfacing and the sealer coat, apply the metallic ground. There are two ways of doing this; in certain finishes one way may prove preferable to the other. The usual custom is to mix the powder or bronze into regular lacquer bronzing liquid, and spray same onto the job. The less usual custom is to first spray on a coat of the clear bronzing liquid properly retarded with sufficient lacquer retarding thinner; as quickly as the coating has reached a "set," the powder must be immediately dusted onto the surface—following around in the same rotation of parts as the liquid was applied.

The powder may be dusted on by blower or in any manner to promptly cover all the surface liberally. The excess is not bound on and in a few minutes it may be blown off and finally wiped over with a wad of absorbent cotton or gauze. The dusted finish is much more brilliant than the mixture of bronze and liquid. A uniform application of shading stain would be necessary in some cases; and in the case of oxidized silver the gray-black shading stain should be applied uniformly, following a previously patterned sample. If this work is skilfully done the general effect will be good; but conversely if it is not previously practiced until satisfactory, the result may be very bad.

*In this article the author discusses and suggests finishes for concrete caskets, and also the vaults into which some caskets are placed.

Since surface effect and not depth is wanted, the final finishing should consist of only one or two coats of furniture rubbing lacquer to allow smoothing down without cutting into the metallic powder; and a coat of dull or flat lacquer.

True gun metal finish may be likened to a black tarnished copper alloy, because the metal itself—originally used as cannon metal—was a bronze ordinarily composed of nine parts of copper and one part of tin. It is a brownish-black, with a faint purplish tinge. It is not a desirable color except where intended to convey significance of utility or occasion. Its appropriateness as a finish for caskets would serve for a military personage. Other than that it likely wouldn't be selected; therefore a compromise finish is suggested as possibly serving the same utility when required, but of perhaps a limited general service also. In this I visualize a two-tone effect which might be accomplished in somewhat this manner:

Say two coats of very dark lacquer pigmented with bone black (drop black) which is a brownish black and not strong covering; and with just a trace of ultra purple. Over this a coat of glaze composed of clear lacquer with a very small amount of burnt umber lacquer enamel, and carrying perhaps ¼-lb. or less of pearl essence per gallon merely to impart a little radiance to the general color. A final coat of flat lacquer. Flat lacquer over a blackish color would show too milky or cloudy, on account of its self color; therefore to obviate the discoloration, add a small amount of coloring—or lacquer enamel—of such shade as would best tone up the preceding color ensemble.

### Wrinkle and Feather Finishes

I shall not go into much detail on this, because it is baked finish and probably few casket manufacturers have facilities for doing it. In brief, the following description is related so you may know the general characteristics of the material and finish.

The making of the products is a patented process, but the materials may be obtained from licensed producers advertised in INDUSTRIAL FINISHING magazine. It is specially prepared varnish composed of varnish gum and China wood oil, strong drier and fast thinner. It is very heavy body and is applied in a heavy coat. Baking sets up the surface so rapidly as to completely pucker the film into fine wrinkles.

The material can be manipulated to produce varying effects of fine and coarse wrinkling, feathery effects (hence the term "feather finish"), etc. It is a beautiful finish and perfectly appropriate for finishing caskets. It is not to be confused with crackle finish and similar grotesque work. Is produced in many colors, although black is most popular and beautiful. It may be seen on deluxe sewing machines, scientific instrument bases, electrical apparatus, etc.

Obviously, in baked work, all moisture in the cement forms would have to be carefully expelled at moderate temperature before any undercoating is begun; otherwise the final baking of the finish would expel the moisture and blister the paint coats, and undoubtedly also ruin the casting by expansion of the contained water. I would advise paint-type undercoatings altogether for this work, and before doing any experimental work at all I would consult the manufacturers of feather finish for

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their recommendations on the entire procedure.

### Luminous Casket Finish

Before concluding, I venture to propose a novelty in finish for burial vaults. So far as I am aware, the idea has not heretofore been expressed nor put into execution; and casket makers may never feel emboldened to follow it. However, I believe this idea warrants a demonstration in the show room to gain the deciding public opinion.

The innovation I suggest is to use radio-active luminous compound in a finish coating for certain work, specifically for juvenile caskets finished in white or light gray. In service the casket is usually placed in a location of subdued light. In the semi-darkness the luminous finish to be described would emit a soft glow of ethereal light which might partake somewhat the appearance of a halo surrounding the casket.

Radio-active luminous compound is radium with a specially prepared radio-responsive phosphorescent sulfide. Fortunately, such material is procurable commercially; it is frequently spoken of as "radium paint." Everyone is familiar with it as the luminous paint on watch and clock dials and hands, compasses, airplane instrument boards, automobile instrument dials; it is extensively used in a wide field on all objects to be viewed in darkness or semi-darkness. "LUMA" is the trademarked name of the radium luminous compounds developed and manufactured by the Radium Dial Co. in New York. The phosphorescent compounds are produced in several colorations, dependent on the various mineral salts used, and also on the method of making. They are made in crucibles in furnaces, and at elevated temperatures. For our purpose under discussion, I would suggest either a pale or golden yellow luminescence.

The application of luminous paint should always be made over a white or light colored surface. White lead undercoating is to be avoided because lead discolors; and never apply luminous paint over black, because black and dark backgrounds reduce the resulting luminosity. It might be feasible to apply over the white lacquer ground a coating mixture of clear lacquer with pearl essence and LUMA; or perhaps the coating of LUMA in lacquer, applied over the white ground, could be recoated with lacquer containing only a small amount of pearl essence.

The idea in trying to use pearl essence in combination is only to obtain a better color if possible. Pearl essence is whitish, although not opaque like a pigment. The radium compounds are usually somewhat greenish-yellow; therefore, in some manner, it would be quite necessary to overcome as much as possible the discoloration that would ensue from the luminous compound if we are to produce a finishing color of say a suitable light gray such as customarily used on caskets. This will involve experimentation. I believe a suitable color effect can be had.

## *Grained Paneling*

A booklet illustrating many beautiful room interiors done in grained panels—Horneer Panels—comes from the A. C. Horn Co., Horn Bldg., Long Island City, N. Y. The panels illustrated are true reproductions of beautifully matched expensive hardwoods. According to Mr. A. C. Horn, President, the grain transfer from graining equipment plates can be made on practically all types of smooth surfaces—wood, composition, linoleum, paper and metal.

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Chart "A" of the Taylor color Harmony Keyboard is 22 x 15 inches and shows 96 different colors. It is accompanied by two black cardboard masks which can be adjusted to show four different tones of each color. Price $5.00.

## Practical Publications, Inc.

802 Wulsin Bldg., Indianapolis, Ind.

*What Trouble We Had With - - -*

# Wrinkle Finish

## *and How We Remedied It*

### by Fred Mannhardt

***"During the recent extra severe winter, this trouble has probably occurred to many others, and the sooner they know the cause of it the better. I sweat blood before finding it out, and I am glad of this opportunity to pass my experience along so as to help the other fellow."—***

*Fred Mannhardt*

THE WRINKLE FINISH produced by baking wrinkle enamel is sometimes referred to as a hit-or-miss proposition. I have had various theories advanced to me by paint men who presumably knew their business, but nevertheless I had a lot of trouble until we started a process of elimination to find the cause of it.

For months things went along all right. Then trouble began—spots, blisters, dull work, no wrinkles, etc. We tried using foul air, and then fresh air in our oven; we changed gas heaters; changed the distribution of heat in the oven. We even went so far as to buy a new hose for our spray gun. We thought that possibly it was in the finishing material. We tried the same material again a few days later and got good results, so we knew then it was not the enamel.

The finished work looked fine where the direct heat hit the surface, so we felt sure that moisture was causing our trouble. We put another air strainer up near the spray gun connection, and we also had one near the compressor. Still the trouble went on, but it was not so bad. Then we heated the metal surfaces to be enameled so as to make them perfectly dry and warm. Finally we came to the conclusion that cold air entering the compressor might be causing our trouble. Such was really the case. What a difference it made after we changed this condition! The work turned out uniform and entirely satisfactory.

This was a real problem until we found what was causing our trouble. Undoubtedly it has caused a lot of trouble throughout the finishing line—especially in winter time. This experience cost us plenty of grief and by telling about it in INDUSTRIAL FINISHING, I trust it will help others to avoid such trouble.

In some factories the compressor is located in a cold room, or in a damp one. This is all wrong.

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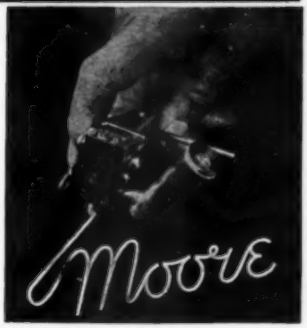


A few hours' practice makes a beginner into a speed-expert with lacquer, water color, flat color enamel, gold size, bronze or ceramic striping paste.

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Warm dry air is always needed for spray finishing. Cold air coming through the line has a tendency to cool the paint or finishing material, which thickens it. The wrinkle enamel, when it enters the spray gun, may be warm enough but gradually it cools as it's being used—if it is blown on with cold air—thereby causing the trouble I have just mentioned. The first piece may be all right; the next one not quite so good, and so on until that container of material is used.

Too much moisture coming through the gun can cause blisters after the work is under heat in an oven. Also, blisters will be caused by spraying the enamel

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TO PLAY BRIDGE, ON THE HURRICANE DECK.
MY FATHER'S IN THE COAL BUSINESS—
WHAT DOES HE DO?
HE COLLECTS THE ASHES.

onto cold metal surfaces. If enamel is sprayed on a cold metal surface and then heated, the surface is bound to sweat, which will cause blisters. This is sometimes laid to acid on the surface of castings—left there by the pickling process.

Another thing before closing: Do not leave your can of wrinkle enamel in a damp place. After using part of it, close the can and put it in a warm dry room. When opening a fresh can of wrinkle enamel, I have found it a good plan to leave the cover partly off while it stands for a few days. This seems to have a very good effect—for some reason unknown to me. Perhaps a chemist can explain it.

Try to keep your enamel at the proper working consistency. The thicker it is the heavier the wrinkles will be. Thin it too much and you get no wrinkles. I know of no hard and fast rules about the proper consistency of wrinkle enamels, outside of what I have just mentioned—and close observation as to its workings. It's well never to thin any enamel before stirring it thoroughly and bringing it up to at least 74°F. Warming the enamel thins it; cold thickens it. If you thin it when it's cold and then place it under heat, it will thin out some more and your job will probably be ruined. I also find that a slow, low, long heat is better to start the wrinkle coming than a quick hot one in the oven.

## J. F. Roche Appointed to Illinois State Advisory Board of N. E. C.

J. F. Roche, Executive Vice-President of Binks Mfg. Co. (spray painting and finishing equipment and spray cooling systems), has been drafted by President Roosevelt as one of the members of the State Advisory Board of the National Emergency Council. His experience as a manufacturer in the City of Chicago covers many years, having been connected with the Edison Electric Appliance Co., a subsidiary of General Electric Co., in the capacity of Assistant to the President for a number of years. Later he became associated with Neil C. Hurley, former Chairman of the Board and President of the Hurley Machine Co., in the purchase and reorganization of the Binks Mfg. Co., and has held the office of Executive Vice-President of that company since its organization.

Mr. Roche is well and favorably known throughout the country; has had wide experience as a manufacturer in the industrial field and is well qualified to deal with all of its various problems.

## Consulting Service Opened by H. D. James

H. D. James, control expert and long a consulting engineer of the Westinghouse Electric & Mfg. Co., has opened an engineering consulting service specializing in industrial and building problems. For manufacturers without technical staffs, the organization offers technical information, assistance in purchasing where engineering questions are involved, cost analysis, and design of equipment. Experienced engineers working under Mr. James' personal supervision are available for special assignments, including electronic and air-conditioning applications.

Mr. James is a registered professional engineer in the state of Pennsylvania; a technical graduate; an original Fellow of the A. I. E. E.; and past president of the Engineers Society of Western Pennsylvania. Headquarters for the James consulting service are located at 1532 Gulf Building, Pittsburgh, Pa.

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# Finishing and Decorating
## Buses, Trucks and Street Cars

### by C. S. Williams

ON NEW WORK, or where the old finish has been completely removed to the bare metal and wood, I suggest the following procedure, using the materials supplied by a reputable manufacturer of high-grade paints, enamels, varnishes and lacquers.

**Operation No. 1**

The surfaces to be finished should be thoroughly cleaned to remove all traces of rust, grease or dirt. Apply a uniform coat of red oxide primer on all metal parts. For brushing, use the material as it comes in the package.* For spraying, thin slightly with turpentine if necessary. On wooden parts, use the same primer as used on metal, but thin with one pint of raw linseed oil to the gallon of primer. Under normal conditions, with a temperature of 70°F. and a good circulation of air, the red oxide primer will require 12 hours' drying time.

**Operation No. 2**

When necessary, spot putty both wood and metal surfaces in order to fill depressions. Let the putty air dry from 4 to 24 hours, depending on the thickness of the putty coats that are necessary.

**Operation No. 3**

Dry sand the putty spots and apply one coat of surfacer over the entire job. The color of surfacer used should be one which makes the most suitable ground color for the exterior synthetic enamel to be used. The surfacer can be knifed full body if desired; or for brushing, it should be reduced with ½ gallon of turpentine to the gallon. For spraying, it should be reduced with three quarts of turpentine to the gallon. Allow overnight drying before sanding. If a second coat of surfacer is necessary, allow four to six hours for drying between the first and second coats.

**Operation No. 4**

Sand the surface coat with No. 280 waterproof sandpaper. If water sanded, sufficient time must be allowed to completely dry the moisture before the application of any enamel coat. Then apply exterior synthetic enamel in the color desired.

**Striping; Lettering**

Stripe, letter, or apply transfers after allowing enamel to dry overnight. When necessary to size transfers, use transfer varnish.

*These recommendations are based on the use of a certain type and brand of finishing material. Naturally, the materials of other manufacturers will do the job too, but some difference in thinning and drying time may be required. Always use materials according to the manufacturer's directions.

This varnish is designed particularly for applying the transfers. It is of suitable body, light in color, and brushes easily. It will dry dust free in two to three hours and has the tack that makes it an excellent adhesive for transfers. It will dry hard in 12 hours.

For penciling in transfers and gold leaf, or for over-all finishing where that procedure is advisable due to a large amount of transfer work on the vehicle being finished, I recommend the use of synthetic spar varnish.

For striping or lettering, use exterior synthetic enamel or automobile enamel, as it comes in the package. If it is necessary to thin the enamel, reduce it slightly with turpentine.

### Refinishing

When refinishing over old paint or varnish, the surface should be thoroughly cleaned, free from grease, dirt, wax, or any other foreign materials, to insure proper adhesion and drying of the new coats. The surface should be carefully sanded with fine sandpaper or rubbed down smooth, using waterproof sandpaper and gasoline or water; and when thoroughly dry the entire surface should be given a coat of oil primer of the proper shade. For brushing, use the material as it comes in the package. For spraying, thin slightly with turpentine if necessary. The primer will act as a ground and sealer coat for the succeeding coat of exterior enamel.

### Operation No. 2

Sand lightly with fine sandpaper, dust carefully, and apply exterior synthetic enamel in color desired. Exterior synthetic enamel may be applied directly over the old surface, providing the surface is free from checks and is in good condition, and presents a tight film in order to hold out the exterior synthetic enamel and not show any dull spots in the finished job.

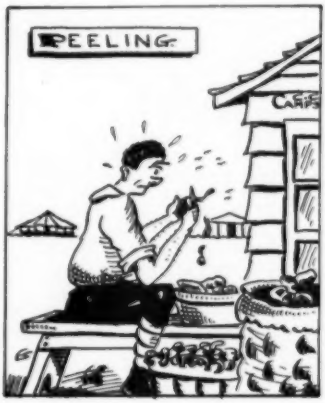
### Over Lacquer Surfaces

Sand down the entire surface with fine sandpaper and wash thoroughly with high-test gasoline. A lacquer finish which has been waxed should be sanded with turpentine and sandpaper, and then washed thoroughly with high-test gasoline. Apply a coat of oil primer of the proper shade. For brushing, use material as it comes in the package. For spraying, thin slightly with turpentine if necessary.

### Operation No. 2

Sand lightly with fine sandpaper, dust carefully and apply exterior synthetic enamel in the desired shade.

For putting on stripes or letters, follow directions given in this article under the paragraph head "Striping; Lettering."



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# Bleaching as a Wood Finish Operation

## by C. F. Scribner

FREQUENTLY the finishing department is called upon to remove stains from wood to be finished or refinished, by the use of bleaching compounds. These stains may be water or weather stains, rust stains, etc. Often bleaching must be resorted to for large surfaces of oak, walnut, birch, maple and other woods, which require to be finished in as light a color as possible. Then too, in refinishing it is often found that the wood is too dark to take a light color stain, and bleaching must be done in order to make an acceptable job.

Water used in the bleaching solutions raises the grain of the wood, consequently, after the surface has been allowed to thoroughly dry, it must be sandpapered to remove the raised wood fibers. A thin coat of shellac—about 2-lbs. of shellac gum to 1-gal. of denatured alcohol—brushed on and allowed to dry, makes these fibers easy to remove.*

After bleaching, the surfaces may retain some of the chemicals; if so, immediate sponging with clean water will be necessary. A coat of ordinary vinegar will assist in neutralizing any traces of alkali left by the solutions, and will put the surfaces in suitable condition for the finishing process. At least 12 hours should be allowed for a thorough drying of the surface before finishing begins.

Many chemical solutions are used for bleaching; some are more effective on certain woods; others succeed better on other woods. Oxalic acid solutions are used by the majority of house painters. Before using any solution, clean and scrub the surface, using hot water to which soap and a small quantity of sal soda has been added. I suggest using No.2 or No.3 steel wool for scrubbing, washing well with clean water and a sponge.

Oxalic acid crystals can be purchased from any drug or paint store. Make up a saturated solution, dissolving as much of the acid crystals in a gallon of hot water as the water will take up. Apply the solution hot, using a flat wall brush, and let it dry on the surface. For bleaching dark sap stains and weather stains, about 8-oz. of crystals to 2-qts. of water is sufficient. When the first application does not give the desired results in color, apply the solution two or more times, as may be found necessary. For greasy surfaces, rub with denatured alcohol and let dry before the bleaching solution is applied.

Dissolved in water, chlorinated soda makes an effective bleach, especially if it is followed by a solution of peroxide of hydrogen. This solution is used as follows:

*Sealers other than shellac can be used if desired.

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**Solution No. 1**

Sal soda.....5¼-oz.
Water .....10-oz.
Dissolve.

**Solution No. 2**

Chloride of lime.....2½-oz.
Water .....6-oz.
Mix well and allow to settle.

Pour the clear liquid of solution No. 2 in another container and a sediment will be found in the bottom of the first container. Add to this 6-oz. of water and stir well. Let settle and pour off the clear fluid as before. Add 1 or 2-oz. of water to the remaining sediment; stir well and strain into the second container through filter paper.

Mix solutions No.1 and No.2, and a clear liquid bleach of green color, and having a faint odor of chlorine and a strong alkaline taste, results. Use this solution hot and brush on with a flat wall brush; let dry and wash the surface with clean water.

For bleaching walnut, ordinary chloride of lime dissolved in water and brushed on the wood has been found satisfactory. It will work on many other woods too.

Permanganate of potash dissolved in water and used in varying strengths makes an excellent bleach. The wood will have a purple tint when dry. The solution is to be applied with a brush and, when dry, a second coating of a saturated solution of hyposulphite of soda in water will "fix" the tint. A 5% solution of oxalic acid in water has been found an effective second coat treatment over the permanganate of potash.

Hydro-sulphite of soda, when used as a 10% solution in water, has been found to be a satisfactory bleach. One or two coats brushed on and allowed to dry thoroughly following each application, then washing with clear water, has proved to be the required treatment.

## Finishing Fancy Inlays

INLAY WORK, to show up attractively, must be designed, laid and finished with great skill and care. First it should be matched to harmonize effectively in the white, for if it is not properly matched it will be difficult to finish.

If the piece you are finishing is inlaid with different kinds of veneer, your inlays should be finished so they will harmonize with the other veneer. For example, suppose you are going to finish a table top veneered with mahogany and inlaid with satin wood. Now the satin wood should be stained (or perhaps I should say tinted) with the same stain as was used on the mahogany—only the stain should be reduced (weakened) so there is just enough color left to give the satin wood the same tint as the mahogany—although there will be a distinct difference between the colors of the two woods. This skillful tinting will produce color harmony, whereas if the satin

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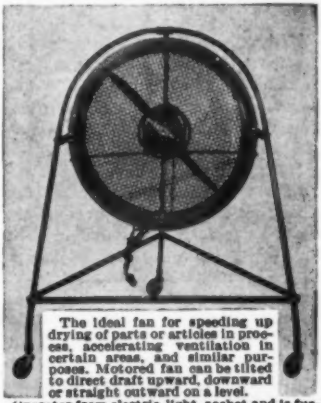

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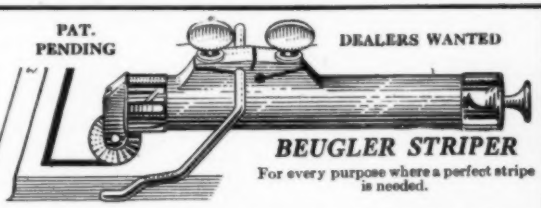

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wood were finished natural there would be too much of a contrast and as a result the table top would be cheapened in appearance. All inlays should have a tinge of the same color as the predominating veneer, which is really the background of the picture.

To make veneers harmonize they should all have one tint of color in common. For instance, if you were going to stain a piece brown, the inlay in this piece could lean to black or red, because it takes these two colors to make brown, therefore either would harmonize effectively.

Nature is the best color harmonizer. When the leaves are on the trees and everything is green, just stand at your window and look at Nature's splendid display of colors. They harmonize perfectly.

All marquetry work should be finished natural. Color marquetry should be shellacked before staining to prevent it from taking up stain. The marquetry work should stand out clearly and distinctly.—BEN J. STUDER.

---

EDITOR'S NOTE: When designing inlaid areas, an attractive contrast with suitable color harmony can be secured by changing the direction of the grain of wood in the inlays—that is letting the wood inlay grain run across or at a 45° angle to the direction of grain in the veneer into which the inlay is set. The angle at which the grain of wood is cut in inlays and other ornamental sections influences the reflection of light from such areas, making them appear dark when viewed from one direction and light when viewed from another. This much of the artistic effect can be produced only through the cutting and laying of the veneer.

When staining inlays which must be lighter than the main or background veneer, a rapid and effective method is to stain the entire area in the predominating darker stain; then follow quickly by wiping off stain from the inlays or sections which are to be left light. This can be done carefully, skillfully and quickly so that the stain is wiped only from the inlays. Where the stain is allowed to remain longer, and naturally penetrate deeper, the final result is the same as though a weaker stain had been carefully applied to the inlays while full strength or darker stain had been as carefully put on the other areas.

---

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## Improvement for Stencils

WHEN THE extensive use of stencils is considered, it has always been a matter of surprise to me that someone has not hit upon the idea of making each stencil so its underside will clear the surface against which it is pressed by say 1/32 or 1/16-in., in order to avoid blots and smeared edges when it is removed after paint has been sprayed through it. The round head of a small nail, tack or rivet, or a carefully spaced drop of solder, at each of the four corners would serve to elevate the underside of the stencil slightly from the surface to be coated.

The rivet heads could be of such size as would allow the stencil itself to clear the surface, so that when the spray gun is used, even at an angle, the stencil would be close enough to avoid a ragged edge. Then, when the stencil is removed, the operator is absolutely assured it will not touch and mar the stenciled surface.—W. E. G.

## To Ebonize Veneer

HERE is a formula for ebonizing veneer for inlays before they are laid: Dissolve 6 to 8-oz. of nigrosine to the gallon of alcohol, and place this solution in a tank large enough for dipping the veneers. Use steam for heat, and heat the solution to the boiling point. Leave the veneer in for about one hour; then remove the veneer and dry it, using a plate dryer if possible. Repeat this procedure until the veneer is properly colored clear through. This cycle of steaming and drying may have to be repeated four or five times, depending upon the thickness of the veneer. When the color is clear through and the veneers are

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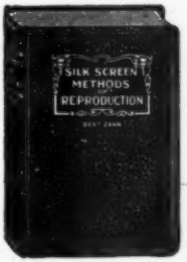


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dry, they are ready for use. Black inlay will harmonize effectively with practically any kind or color of veneers.—BEN J. STUDER.

EDITOR'S NOTE: Some finishers claim they get an effective ebony black with a single dipping of the inlays by using a strong water solution of jet black nigrosine heated to a temperature under the boiling point. Inlays are seldom more than 1/16-in. thick, and they are generally very narrow. A warm water solution of jet black nigrosine will penetrate deep and quickly—except possibly on some of the hardest of close-grained woods like maple, for example, which might require a second dipping or a longer period of immersion.

## Decorative Chromium

WIDE USE of chromium plating as a finish is now standard practice in several types of electric refrigerators. The trim for the doors, such as hinges, door openers, catches, etc., is now made of a metal which has the buff-colored chromium-plated finish and is non-tarnishing as well as attractive. In many such refrigerators the shelves are of a skeleton design, heavily tin-coated for sanitary protection.—C.F.S.

## Use Masking Tape

MASKING TAPE, as such, is certainly new to none of us but the idea of using masking tape in combination with stencils, to hold the stencils firmly against vertical and other surfaces, and thus relieving the workman's wrist from "stenciler's cramp," may be a little new to some of us. Especially in connection with two-color work, the freedom of both hands which is allowed by this method is well worth while, as with a moderate amount of practice on designs not too elaborate one may develop the ability to handle a separate pouncing brush with each hand—or he can spray the design more efficiently when the stencil does not have to be held manually. A recently developed tape is very good for this purpose, as well as for the uses to which it is more frequently put. —P.F.K.

## *H. O. Swoboda, Inc., Announces Cleveland Representative*

H. O. Swoboda, Inc., (Electric Heating) 4301 Main St., Pittsburgh, Pa., in a letter to this office, says:

"We take pleasure in announcing the appointment of Maxfield Pease with offices located at 4614 Prospect Ave., Cleveland, Ohio, as exclusive sales representative for the entire Northern Ohio territory covering our lines of Falcon continuous electric

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heat-treating furnaces, Falcon bare electric immersion heaters, and other Falcon industrial heating equipment to meet specialized applications. Mr. Pease has had considerable experience in the industrial field and succeeds the late E. H. Merrick who died during the latter part of January."

## Moisture-proof Walls

According to the Stonhard Co., 401 N. Broad St., Philadelphia, Pa., Stonhard Stonhide is a waterproofing material which will permanently stop moisture and driving rain from breaking through practically every type of building wall—brick, concrete, stucco, etc. The material is transparent and can be applied without discoloring the surface treated. In this waterproofing liquid there is a penetrating element which causes the material to penetrate the surface treated to a depth of 1/16 to ¼-in., depending upon the porosity of the surface.

## Letters from I. F. Readers

*(Continued from page 7)*

the same tinting strength, and are not made as the author evidently thought by simply taking the paste colors and thinning them down with oil to a thinner consistency.

We believe these liquid colors are a distinct advance, as they enable the painter and decorator to more readily tint his batches on account of the fluid colors mixing so much quicker, and not lumping up in the paint.—D.J.Tight (with R.N. Nason & Co., San Francisco, Calif.).

## Enamel for Chromium

Kindly advise us if you know who can make any black or white enamel which can be applied to a highly-polished chromium-plated surface—an enamel which will stick without chipping.—N. Mfg. Co. (Lighting Fixtures).

## Crystal Japan Finish

We are very much interested in an article appearing in the February issue regarding "Crystal Japan Finish on Metal" (page 26). We would appreciate it very much if you could furnish us with the name of the manufacturer who is putting this material on the market, so that we can take the matter up with them for further investigation.—T.B.T. Co. (Shears & Scissors).

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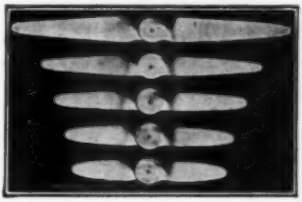

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## Inch Wide Stripe Wanted

Have you a striping machine that will paint a stripe 1-in. wide? We are contemplating going into the manufacture of table tennis sets in volume. As you know, the stripe on the ping pong tables is 1-in. wide. If you have, or can manufacture, a striping machine for this purpose, would appreciate your immediately advising us regarding the price of the item.—B.Q. Co. (Plywood).

## Bone White; Ivory White

We would appreciate your advising us where we can get "Bone White" and "Bone Ivory" paint to finish wood breakfast sets.—X.L. Table Co.

## Clear Rust-Proofer

We are manufacturing from high-finished, cold-rolled, strip steel a product which is used in connection with an item that must go into cold storage for two or three months during the fall period. There is a possibility of rust, and we are looking for a rust preventative that will not interfere with the high finish of the material. We are wondering if you know of any such product and can direct us to the proper people.—J. Mfg. Co. (Light Metal Goods).

## Outside Meter Finish

We are developing a coin slot meter for the market and at present we have the problem of finding a finish that will both adhere to die-cast metal and withstand severe weather conditions, as in some cases it will be attached to a pole with no protection the year around—when used for metering tennis court lighting, as an example.—V.N.Co. (Electrical Timing Meters).

## Light Globe Finish

Referring to the published letter in February INDUSTRIAL FINISHING, under the title "Light Globe Finish," page 7, I notice something in the March issue of "Silicate Ps & Qs," put out by the Philadelphia Quartz Co. of California, Ltd., 6th & Grayson Sts., Berkeley, Calif., which may be of value to those interested in this subject. In an article about Silicates, I read the following:

"The insoluble silicate preparations derived from silicate solutions constitute a varied collection not without interest—particularly in view of the fact that while we have some general knowledge of their properties and ways to make them, their ultimate constitution is more or less obscure. A familiar example is the colored coating seen on incandescent lamps for advertising purposes and, to some extent, on other glass objects.

"The principle of making these has been well described in the patent literature. Broadly, it consists in making paints by grinding pigments in silicate solutions, spraying this on clean glass, drying the paint at a temperature and rate of speed which leaves the colored film intact, and then subjecting the coating to some

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treatment designed to render it insoluble. A strong solution of ammonium salts serves this purpose well. Finally the film may be washed in water to remove soluble salts derived from silicate, as well as excess precipitant, after which the globes are ready for the market."

## Automatic Faucets

In INDUSTRIAL FINISHING for February, page 47, are mentioned automatically closing faucets. Would you kindly give us the name of the manufacturer and supplier—or to save time—ask him to quote us prices on such faucets ¾, 1 and 1½-in.? We are one of the leading manufacturers in Finland of varnishes, nitrocellulose lacquers and paints, and should like to have the faucets for our tanks.—D. Winter & Co., Tammerfors, Epila, Finland.

## Protective Coatings for Metal Work

It was with the utmost interest that I read the above mentioned article in your February issue (beginning on page 16). For several months there has been a dispute in the paint trade journals in Holland and Germany about the advantages and disadvantages of red lead as an anti-corrosive agent in comparison with red oxide.

I myself broke a lance for red lead and was surprised to learn from the description of the tests made in England that the tests with red lead did not give as good results as with red oxide. I would ask the author, E. A. Hurst, whether it would be possible to get a copy of his paper as read at the September meeting of the Electrochemical Society at Chicago. He states that wide publicity has been given to this paper in technical magazines throughout the United States. Could you please supply me with a full copy of the paper read, or if not could you supply me with copies of the technical magazines referred to in the article in I.F.? Eventually I could order these copies myself if you would be kind enough to give me the numbers and names of the magazines in question, and addresses of the publishers.

### Crystal Japan Finish on Metal

Will you please give me one or more addresses of manufacturers of crystal japan finish for use on metal; also for use on wood?—E. Rijgersberg, The Hague, Holland.

**Rotary Striper**

Rolls out perfect stripes — quickly and easily, greatly reducing costs of decorative striping. Even inexperienced help can use it. Every commodity manufacturer needs one. Try the "Lightning."

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**PAINT SPRAY GUN**

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1402 W. Baltimore St.
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Industrial FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment

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# EDITORIAL

## Recondition Your Equipment

In many factories where activities are being resumed more extensively, some of the equipment is not in first class condition for satisfactory production; some of it has become unsafe in reference to the possibility of accidents or fire. It is suggested that this matter be given immediate attention before something happens that will cost the company a heavy penalty for negligence. Make a careful inspection and check up on everything. It might be well to call in an outside man well qualified for this job, to make sure that the inspection will be rigid and thorough—and to insure a proper report being made on paper so it can be referred to and the items checked off as they are taken care of. The sooner this matter is disposed of, the sooner the finishing department will be adequately and safely tooled-up for the quality of production which is going to be demanded as industrial recovery gets under way.

## Pressed Metal Products

The continually increasing use of pressed metal products has been helped along in no small degree by the development of several materials and processes for conditioning, treating and finishing pressed metal surfaces. We are all more or less familiar with various metal cleaning and rust-proofing treatments—some temporary, some permanent—bake and air-dry finishing, graining and coloring in imitation of fine hardwoods, marble, leather or other natural products, novelty finishing of great variety in pattern, color, luster and depth, but how many of us realize the importance of sound-deadening compounds, which, sprayed upon hidden surfaces of the metal, positively prevent that metallic ring, buzz, clang or roar which was formerly such an objectionable feature in certain metal products. Sound deadener, applied with finishing equipment, has been the means of opening market possibilities formerly closed to pressed metal products.

## Electrical Safety for Finishers

Authorities on electrical safety have reached the conclusion that

it is not practicable to keep industrial conduits, housings and fittings free from inflammable gases, vapors and fumes when such electrical apparatus is in rooms more or less heavily charged, either occasionally or frequently, with these invisible but highly explosive elements.

"Being convinced that it was impossible to keep the gases out of the area which we must use for our electrical controlled devices," says one manufacturer of electrical equipment; "we then started working on the theory of confining the inevitable hazard by making the armor of our protected devices strong enough to stand the stress of any explosion which might take place in this isolated space, and at the same time keep it from flashing outside of this zone.

"The gasket has been entirely eliminated from our explosion-proof line. Ground surfaces of certain requirements have been employed instead, which not only make a safer closure but remove the human factor—forgetting to put in the gasket. Also, the sealing of the conduit lines and housings to confine the control devices into the smallest space practical."

It is obvious that there is an important difference in electrical outlet boxes and various metal fittings and apparatus which connect up to conduit lines. In hazardous areas this difference is worth careful investigation. It may mean the difference between safety and a disastrous fire.

---

## *Machine Art Exhibit*

Machine Art is the basis for a large and elaborate Exhibition held at the Museum of Modern Art, New York City, from March 6 to April 30. It was assembled by Philip Johnson, chairman of the Museum's department of architecture. There are 402 exhibits, with more than 1000 items, divided according to use into six divisions: Industrial units (machines and machine parts); household and office equipment; kitchenware; house furnishings and accessories; scientific instruments; laboratory glass and porcelain. No purely ornamental objects were exhibited but the useful objects were chosen for their aesthetic quality.

This Exhibition was assembled from the point of view that though usefulness is essential, appearance has at least as great a value. Every exhibit was chosen for its beauty of form, finish and material. The objects shown were produced by machines for domestic, commercial, industrial and scientific purposes. A guiding principle in selection was furnished nearly 2500 years ago by Plato in defining beauty of form: "By beauty of shapes . . . I mean straight lines and circles, and shapes, solid or plane, made from them by lathe, ruler and square. These are not, like other things, beautiful relatively, but always and absolutely."

A. H. Barr, Jr., Director of the Museum, states that, "in addition to perfection of shape and rythm, beauty of surface is an important aesthetic quality of machine art at its best. Perfection of surface is, of course, made possible by the refinement of modern materials and the precision of machine manufacture. A watch spring is beautiful not only for its spiral shape but also for its bright steel surface and its delicately exact execution."

The exhibits were loaned by 80 of the leading manufacturers of the United States. The great im-

portance of finish and design is in evidence on practically every one of the more than 1000 objects exhibited and which were selected from many thousands for their beauty of form, finish and material.

The background against which the objects were displayed was not general but specific, and was designed to concentrate maximum attention upon the exhibited articles. The entire floor plan of the Museum and the surface of the walls were changed for this occasion. Movable screens, panels, and spur walls of aluminum, stainless steel, and micarta were employed; also coverings of oilcloth, natural Belgian linen, and canvas in painted pastel colors. Stands and display tables were built of aromatic cedar and Circassian walnut; shelves were of black and white Carrara glass.

This exhibition provides another emphatic manifestation of the decided trend toward more beauty of form and attractiveness in surface color and finish for all useful articles produced in factories.

## Another Possible Source of Finishing Trouble

THERE IS no denying that processes used in different enameling plants may and do vary widely, and there is no use denying that the results obtained in different plants also vary. Over here is a plant that seems to have the very best of success in producing a first-class enameling job, and over there is another one which doesn't do so well. But it does not necessarily follow that the processes actually pursued in these two plants are very widely different; the trouble may easily lie in their sources of raw material.

Suppose, as an instance, that each of these good enamelers buys steel sheets from a different source. Then the difference in results may lie entirely with the sheets, and sometimes it does lie there. One maker of steel sheets may, for instance, use any old kind of pickling equipment. The other is wide awake and has learned that pickling equipment made of Monel metal not only resists corrosion and thus makes for low maintenance costs, but that at the same time it absolutely insures a cleaner enameling surface. Since Monel metal is now available in all kinds of commercial forms, including rods, sheets, bars, angles, and even chains, pickling equipment made of it is easily fabricated.—B.W.A.

## *Takes Charge of Hercules' Cellulose Products Dep't*

Mahlon George Milliken has been appointed general manager of the Cellulose Products Department, to succeed A. B. Nixon, who was named general manager of the Naval Stores Department. Mr. Milliken comes to Wilmington, Dela., from Parlin, N. J., where he was superintendent of the company's nitrocellulose Union Plant.

## *H. D. Binks Returns as Head of H. D. B. Corporation*

H. D. Binks, former manufacturer of spray equipment and an authority on spray appliances, announces his return to this business. Mr. Binks re-enters the manufacturing field as president of the H. D. B. Corporation, with factory and general offices at 900 N. Spaulding Ave., Chicago, Ill.

Mr. Binks was one of the first engineers to develop a spray gun that would successfully apply lacquer. His many patents covered not only spray guns, but also many types of spray nozzles and allied equipment for industrial purposes, many of which are being used throughout the world today.

## *"Lakeroff Soap"*

A letter from Roland W. Inglis, of Potter & Inglis, Inc., Cortland, N. Y., includes this information:

". . . . in new and useful things for the industrial finisher, we take the liberty of calling your attention to our "Lakeroff Soap" . . . . which will completely remove paint, varnish, and lacquer from the hands and leave them soft and clean . . . . no more raw chapped hands for the finishing room worker, who has hitherto had only sharp irritating solvents with which to wash up after the days' work. The product has been well received locally."

## Metallic Pyroxylin Enamels

H. V. Walker Co., Elizabeth, N. J., is sending out a small 4-page folder on the subject of metallic enamels, wherein 15 standard nonfading colors are listed—statuary bronze, silver, copper, brass, five kinds of gold, green, blue, black, old rose, etc. These finishes are attractive and have good adhesion over most surfaces. Where a primer is required the company recommends its pyroxylin metal primer.

# Classified Advertising

**Advertisements under this heading 45 cents a line per insertion, minimum charge, $1.35. In estimating, calculate six words to one line, and add one additional line for heading. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.**

### POSITION WANTED

By Lacquer Salesman. Have accredited industrial accounts and large potential possibilities in Middle West. Only salary, expenses and bonus considered. Am employed, with 20 years' experience. Address IF-517, care Industrial Finishing.

### SALES MANAGER WANTED

Well-known and established manufacturer of industrial finishes, making high-grade line of all types, will consider application from experienced sales executive to supervise its Industrial Sales Department. Good education, ability to select and train selling organization essential. Right man will earn good salary to start with interest in the profits. Possibilities unlimited. Give detailed experience, full information, which will be treated strictly confidential. Address IF-518, care Industrial Finishing.

### POSITION WANTED

Finishing Foreman, experienced in all kinds of Finishes on WOODS and METALS, Air Drying and Baking, handle any number of men, latest methods of Production, Chemical experience of materials, best references to Character, Mechanical, Executive Abilities. Salary open. Will go anywhere. Address IF-516, care Industrial Finishing.

### SALESMAN WANTED

We require the services of an experienced paint, varnish and lacquer salesman for the state of Wisconsin. Our line is complete and strictly high grade. We cater to industrial trade only. A wonderful opportunity for a man with a clean and successful record. Address IF-515, care Industrial Finishing.

### SALESMEN WANTED

Manufacturer of complete line Stains, Fillers, Varnishes, Lacquers, etc., desires experienced salesmen with following among furniture manufacturers in Wisconsin, Michigan and Indiana. Our present salesmen know of this ad. State age, experience, references and territory desired. Address IF-514, care Industrial Finishing.

### GRAINING ON METAL PHOTOGRAPHIC REPRODUCTION METHOD

Do you manufacture a metal product which you desire to have grained in mahogany, oak or walnut? I have the necessary plates, equipment and skilled workmen to do this for you. Can arrange to do this work at your plant, using my equipment and workmen, within a reasonable distance. The demand for metal products with grained finish is increasing every day. You have the product and I have the graining equipment. Let's get together.

GEORGE R. DUGGAN,
143 Oak Street, Holyoke, Mass.

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## JONFLEX

In all respects the same as PERMACEL . . . except for fine, strong, flexible cloth backing in place of paper.

## INDUSTRIAL

Differs from JONFLEX only in its heavier, less finely woven cloth backing. All three tapes are the top-notch achievements in masking tape manufacture.

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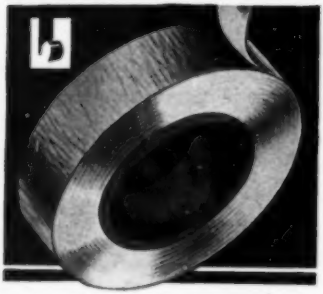


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